United States Patent [19]

Birkhofer et al.

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[54] **CONTROL SYSTEM FOR INJECTION-MOLDING MACHINE**

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[30] **Foreign Application Priority Data**

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[51] **Int. Cl.**[2] **B29F 1/06**; F15B 21/02

[58] **Field of Search** 425/135, 145, 146, 155, 425/156; 91/35, 452, 454, 449; 222/334; 60/368

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[57] **ABSTRACT**

An injection-molding machine has a drive ram with a pressurizable chamber that can be connected either to the high-pressure side or the low-pressure side of a source of fluid under pressure. A control system operating this machine has a pressure-reducing valve with an inlet port connected to the high-pressure side of the source, an outlet port connected through a cut-off valve and a throttle to the chamber of the ram, and a pilot port pressurizable to control the pressure at this outlet port. A pressure-relief valve has an inlet port connected to the pressurizable ram chamber, an outlet port connected to the low-pressure side of the pressure source, and a pilot port pressurizable to control the pressure differential across this pressure-relief valve. A pressure-control valve has an outlet side connected to the low-pressure side of the source and an inlet side and is operable to maintain a first predetermined pressure differential between its inlet and outlet sides in an injection mode and to maintain a certain predetermined pressure differential between its inlet and outlet sides in a clamping mode. A check valve has one side connected to the pilot port of the pressure-reducing valve and another side connected to the pilot port of the pressure-relief valve for fluid flow only from the former to the latter. A function-control valve has a first connection coupled to the inlet side of the pressure-control valve and a second and third connection each coupled to a respective one of the pilot ports. This function-control valve is operable between a filling position connecting the pilot port of the pressure-relief valve to the pressure-control valve and an injecting/holding position connecting the pilot port of the pressure-reducing valve to the pressure-control valve.

10 Claims, 3 Drawing Figures